DOCUMENT RESUME

ED 215 823 RC 013 325

AUTHOR Conrad, Dan; Hedin, Diane
TITLE Experiential Education Evaluation Project. Executive Summary of the Final Report.
INSTITUTION Minnesota Univ., St. Paul. Center for Youth Development and Research.
SPONS AGENCY General Mills Foundation, Wayzata, Minn.; Rockefeller Family Fund, Inc., New York, N.Y.; Spencer Foundation, Chicago, Ill.
PUB DATE [Sep 81]
NOTE 55p.; For related document, see RC 013 326.
AVAILABLE FROM Center for Youth Development and Research, Univ. of Minnesota, 386 McNeal Hall, St. Paul, MN 55108 ($2.00).

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Adventure Education; Career Awareness; *Evaluation Methods; *Experiential Learning; Internship Programs; Outdoor Education; *Program Effectiveness; Program Evaluation; Secondary Education; *Student Development; Student Volunteers
IDENTIFIERS *Experiential Education Evaluation Project

ABSTRACT

In order to fill the gap in obtaining hard evidence to test or document the impact of experience-based education on student participants, the Experiential Education Evaluation Project was undertaken May, 1978 and administered to 4,000 students in 33 programs. There were four major types of programs: volunteer service, career internships, outdoor adventure, and community study/political action. Specific purposes were: (1) to define experiential education and develop a typology of programs; (2) to assess impact of experiential education programs on psychological, social and intellectual development of secondary school students; (3) to identify existing measures and instruments and to design new ones for assessing these outcomes; and (4) to use data to identify program variables and practices that were effective in facilitating student development. Five test instruments and two questionnaires were used to measure students' social, psychological and intellectual development. Data were analyzed in two phases: pre-post results were compared for each experimental and comparison group and specific features of programs were examined to assess their influence. Findings included experiential education programs had positive impact on students' psychological, social and intellectual development and characteristics of the experiences of individual students were powerful predictors of growth. (ERB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED215823

Executive Summary

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☑ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Diane Hedin

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

EXPERIENTIAL EDUCATION EVALUATION PROJECT

RC 01 33325

Executive Summary of the Final Report of the

Experiential Education Evaluation Project

by

Dan Conrad and Diane Hedin

Center for Youth Development and Research
University of Minnesota
1985 Buford Avenue
St. Paul, MN 55108

The work upon which this publication is based was made possible by grants from the Rockefeller Family Foundation, the Spencer Foundation, and the General Mills Foundation. The Spring Hill Conference Center provided the Project with an environment conducive to thoughtful and productive working sessions. We also wish to acknowledge the contributions of Cathy Ingle Carlson and Howard Wolfe in the compilation and analysis of the data.

[September 1981]

Experience is never limited, and it is never complete; it is an immense sensibility, a kind of huge spider's web of silken threads suspended in the chambers of consciousness and catching every airbourne particle in its tissue.

Henry James

James' poetic characterization serves to put the Experiential Education Evaluation Project and this summary in perspective. As experience is too immense, too complex, illusive, even too mysterious a phenomenon to fully comprehend, so also is it the case with what is learned from it. There is no pretense in this report that its tables and numbers have miraculously captured that "sensibility" which has eternally eluded the poet. The report's more modest aim has been to capture some small particles of experience, to reduce some part of the mystery to a size and form that can be grasped, understood, manipulated, and from which conclusions may be drawn and lessons learned. In this Executive Summary, the work of the Evaluation of Experiential Learning Project is reviewed and its fundings summarized. It concludes with some implications for practice and suggestions for further research.

TABLE OF CONTENTS

	Page
Overview of Project	
Case for Experiential Education	1
Purpose of Project	2
Defining Experiential Education	3
Selection of Programs	3
Program Descriptions	
Community Service Programs	5
Outdoor Adventure Programs	8
Career Internships	9
Community Study	11
Comparison Groups	12
Selection of Issues	
The Research Questions	14
The Research Method	
Test Instruments	17
Research Design	17
Analysis	18
Findings: Impact on Students	
Social Development	19
Psychological Development	29
Intellectual Development	32
Summary	35

Findings: Correlates of Effectiveness

Program Features 36
Student Characteristics 37
Characteristics of Experience 37

Implications

Value of Experiential Education 43
Developmental Focus for Education 43
The Need for Experience 44
Personal Growth and Social Improvement 44
Further Questions for Practice and Research 45

References 48

Overview of Project

Case for Experiential Education

The roots of experiential education lie deep in the theory and practice of education. It is primarily in this century, however, and with the prodding of John Dewey, that educators have formally discussed the relation between experience and education and promoted broadened social experience as a foundation for learning and a method of instruction.

Manifestations of experience-based learning have risen and fallen in cyclical fashion throughout this century and, in the 1970's, emerged again as prominent educational practice. During the 1970's a number of blue-ribbon panels issued calls for a broad reform of secondary education, and each firmly recommended that schools extend the breadth and intensity of experience available to adolescents. For example, the recent study of high schools by the Carnegie Council on Policy Studies in Education (Kerr, 1979) recommends that junior and senior students attend classes only three days a week and devote the other two days to education-related work or community service.

The arguments for experiential education are framed in terms that go beyond common educational discourse. They are rooted in a concern for the total development of young people--social, psychological, and intellectual. This development is seen as jeopardized by a social system in which young people are shut off from the experiences, encounters, and challenges that form the basis for healthy development and that add purpose and meaning to formal education. The aim of social development--the development of active, concerned, involved citizens--is jeopardized by practices which insulate the young from adult society and deny them an active and valued role in it. The aim of sound psychological development--of persons who have a clear sense of who they are, what they believe, and what they can do--is jeopardized by lack of opportunity to demonstrate one's worth and to test, stretch and challenge who one is and can be. The aims of intellectual development and academic learning are jeopardized by equating education with classroom instruction in an educational process that produces graduates who are "information rich and action poor" (Coleman, 1974), who have had insufficient opportunity to test and apply that information, and who have not been prepared to continue learning from the experiences of everyday life outside of school.

More by default than by desire or design, the schools have been left to play a central role in the total development of America's young people. Few educators are at ease with the responsibility. Some have chosen to deny its broadest implications and to focus on the schools' traditional aims of developing cognitive skills and transmitting the accumulated experience and wisdom of the society. Others have accepted a broader view--some from a sense of cultural necessity and some from a belief in the interrelationship of all dimensions of development--that no one aspect of it can be achieved in

isolation from the others. Among the latter are numbered many of the advocates of experiential education.

Purpose of Project

While strong endorsements of experience-based education abound, there is relatively little "hard" evidence to test or document the impact of such programs on student participants. There are several reasons for this lack of data. First, there is some confusion over what experiential education is and how it differs from other approaches. This imprecision is a serious hindrance to evaluating its effect. Secondly, appropriate methods and instruments for assessing experiential programs have not been developed. The objectives of experiential programs are varied, difficult to measure, and often idiosyncratic to each specific program--and even to specific individuals within a program. This, plus the fact that the programs are so action-oriented and are located in such divergent settings, means that the traditional techniques of educational evaluation are not adequate for appraising their achievements. For these reasons, little effort has been made to systematically test the assumptions underlying the endorsements for experiential education or to investigate empirically which specific forms, techniques, and practices may be the most effective in realizing the hypothesized benefits.

The Experiential Education Evaluation Project was undertaken to begin filling that gap. The specific purposes were: 1) to define experiential education and develop a typology of programs; 2) to assess the impact of experiential education programs on the psychological, social and intellectual development of secondary school students; 3) to identify existing measures and instruments and to design new ones for assessing these outcomes; and 4) to use this data to identify the program variables and practices that are most effective in facilitating student development.

The project was initiated by the Commission on Educational Issues and co-sponsored by the National Association of Secondary School Principals, the National Association of Independent Schools, and the National Catholic Education Association. It evaluated 27 experiential programs in independent, public, and parochial schools around the country. Over 1,000 students participated in these programs. A preliminary study was also conducted involving nearly 4,000 students in 33 programs.

Primary funding for the Project was provided by the Spencer and Rockefeller Family Foundations with additional support from the General Mills Foundation. The Project was conducted by the Center for Youth Development and Research, University of Minnesota, under the direction of Diane Hedin and Dan Conrad.

Defining Experiential Education

For the purposes of this research effort, experiential programs are defined as "educational programs offered as an integral part of the general school curriculum, but taking place outside of the conventional classroom, where students are in new roles featuring significant tasks with real consequences, and where the emphasis is on learning by doing with associated reflection."

Selection of Programs

The programs included in the study are of four major types: volunteer service, career internships, outdoor adventure, and community study/political action. The categories are described below:

Community Service Programs

Students in these programs were involved in direct community service. In most cases their efforts were channeled through local human service organizations and the students served as volunteers in such places as nursing homes, day care centers, elementary schools, hospitals, counseling centers, and institutions for mentally, physically, or emotionally handicapped people.

Outdoor Adventure Programs

Students in these programs were involved primarily (some exclusively) in outdoor adventure activities. The specific activities included wilderness trips, rock climbing, camping, living in a rural setting, archeological excavation, and the like. The programs were school-sponsored and faculty-led rather than directed by outside agencies specializing in these areas.

Career Internships

Students in these programs served as interns in business, government, arts, education, and social agencies. The major purpose of these experiences was to get an inside view of an organization and occupation, and to test one's interest in and competence for it.

Community Study Programs

Students in these programs studied their communities first-hand by conducting surveys and interviews, and through direct observation. Also included in this category were social and political action projects which focused on efforts to influence (and inform others on) public decision-making.

Comparison Groups

There was at least one comparison group within each of the above categories. The groups were not comparisons to the category as a whole but to a specific program within it. The students were in regular classroom (non-experiential) programs in the same school as the group with which they were paired, and were also comparable as to age, sex, grade, socio-economic status, and grade-point-average.

Within each type, individual programs differ in terms of length--from four weeks to nine months; intensity--from two to four hours each week to full time; nature of reflective component--from none to a daily seminar related to the field experience; student characteristics--from age twelve to ninteen, good students and poor, and from low income to highly affluent; its voluntary or compulsory nature--with nearly all programs being voluntary.

The school programs included in the study were not a random sample of experiential programs. Recommendations were solicited from knowledgeable persons in the field, from the list provided, and participating programs were selected based on 1) a demonstrated record of excellence; 2) a history of being in operation for at least four years; 3) their being an integral part of their school's academic program; and 4) their being representative of one of the four major types of experiential programs. Given the current meager level of evaluation and documentation of experiential programs, it seemed that a study of the most well-conceptualized and established programs would provide the most reliable data on the effects of the practice. Base line data would then be established so that other experiential programs could be tested by similar evaluation practices and compared against these programs.

We assumed, in addition, that the teachers and administrators involved in exemplary projects would be the persons best able to define, articulate, and specify the fundamental outcomes for experiential education. Furthermore, this research effort was committed to an approach which was practical, understandable, and applicable to everyday life in schools. Thus, a "Panel of Practitioners" (the educators who ran the programs being studied), along with the research project co-directors, were responsible for defining the issues to be studied, for helping to select and develop assessment tools, for implementing the research design, and for helping to interpret the data collected. It would be impossible to overestimate the contribution of this Panel to the conceptualization and implementation of the research effort and the interpretation of the data collected. Such cooperation and counsel made this a shared effort throughout, one in which all felt a commitment to its success.

Program Descriptions

The programs included in the study are described briefly below, and grouped according to category.

Community Service Programs

A) Community Service Programs, Bishop Ward High School, Kansas City, Kansas (N=67)

Bishop Ward is a Catholic, coeducational parochial school, and the Community Service Program is a senior semester elective offered within the religion department. Students work with the elderly, in day care centers, tutor elementary students, and the like. Prior to service assignments, students are given an intensive seven day workshop acquainting them with the kinds of problems they will be facing in their placements. For the rest of the semester they spend two or three class periods each week in their field placement and one period every other week in a seminar on their experiences. Most of the students come from middle or lower middle income working class families.

B) Peer Counseling, Work Opportunity Center, Minneapolis, Minnesota (N=16)

This program is part of a CETA demonstration project combining academic study and practical work experience related to the study. It aims at teaching essential knowledge and skills, raising career aspirations, and providing needed pay to low-income students. Participants study human behavior, are trained in counseling skills, and then apply these through working as peer counselors in a center for runaway youth. Each student spends about five hours each week in the classroom (which includes counseling each other as well as more typical academic work) and 10 to 15 hours at the runaway house. Nearly all the students in the program are from families below the poverty level and receive credit for the classroom work and pay for their counseling work at the runaway house.

C) Social Studies Lab, Eisenhower High School, Hopkins, Minnesota (N=41)

Students in the regular 12th grade social studies classes may elect to perform community service in lieu of the book report and/or research paper requirement of the course. There is no formal reflective component in this program, though some of the students do

keep journals and/or write a summary paper on their experiences. The typical involvement for these students is from two to four hours, one day a week, in settings similar to those described above for the Community Involvement Program. One major difference is that with less time on the site they seldom can be assigned equal responsibility with the students in the more intensive program.

D) Community Involvement Program, Eisenhower High School, Hopkins, Minnesota (N=65)

Students in this program are involved as volunteers in elementary schools, day care centers, nursing homes, centers of retarded and/or handicapped children, and in other social service agencies. The program is an option within the school's 12th grade social studies department and carries full academic credit. The students are scheduled into a two-hour block during which they work in the community four days a week and spend one in class. In the class they discuss their field experiences, pursue a curriculum in psychology, and work on interpersonal helping skills. The school is located in an older, working class community surrounded by "bedroom suburbs" of professional families. Most of the students in the program, like those in the school as a whole, are from working class families.

E) Community Awareness Program, Mayo High School, Rochester, Minnesota (N=27)

The Community Awareness Program (CAP) is offered by the social studies department and is open to both 11th and 12th grade students on a first come, first served basis. CAP is scheduled in a 2-hour block within the school day. Students usually spend 3 days a week in community settings such as day care centers, nursing homes, senior citizens programs, and the Rochester State Hospital. Two days are devoted to class seminars that include readings, field trips, discussions, role playing, etc. related to the field placements. Rochester is a community of around 50,000 people located in southern Minnesota. Students are from professional, working class, and rural families.

F) Community Experience Program, Ridgewood High School, Norridge, Illinois (N=33)

In this program, students in grades 10-12 do volunteer-service either in an out of school assignment in day care centers, homes for senior citizens, elementary and junior highs, schools for retarded and/or physically handicapped, hospitals, health faciltites, youth service programs and parks; or special projects such as food drives, a law enforcement project, animal care training program, etc. Students' assignments vary from 3 to 10 hours per week and last for a semester or a full year. Students are required to keep a journal of their experience and attend a seminar dealing with motivation, problem solving, personal growth and communication skills.
Ridgewood is a public suburban school outside of Chicago, which serves a middle-class population.

G & H) Community Commitment Program, Ninth and Tenth Graders (N=21), Eleventh and Twelfth (N=12), Duluth Cathedral High School, Duluth, Minnesota

Approximately half the student body of Cathedral High School is involved in its Community Commitment Program. On one day each week, participating students are released from academic classes from two to seven hours to work in a wide variety of community service agencies while those who remain in school focus on make-up work, special projects, small group work, etc. A student's commitment is for one semester, although most elect to be in the program for two semesters and to work in two different areas of service. Older students work independently, while younger students have a reflective seminar each week. Students also sponsor special days in which groups (elderly, retarded) are invited to the school for a day, and the program also sponsors special summer projects. Duluth Cathedral is an interdenominational parochial school whose student body reflects the full range of religious faiths and socio-economic backgrounds.

I & J) Experiential Education Course, Middle School (N=111) and 12th grade (N=7), Francis W. Parker School, Chicago, Illinois

Middle School students (grades 7-8) and 12th graders were involved in social service activities.

The 12th grade students were in placements in social agencies, hospitals, day care centers, elementary schools, civil liberties union, for 12 weeks from two to five hours per week. A weekly seminar--one hour per week--included discussions of student observations and lectures by professional and various human service agencies and community groups. The 7th and 8th graders were enrolled in a three week course which emphasized both theory and participation in the community. Students spend 6-10 hours per week in a volunteer placement in a community agency (similar to those filled by 12th graders) and one hour in the classroom to share experiences and explore social issues with guest speakers.

The school is an independent, college preparatory school, K-12, which serves the children of upper-middle and upper class families.

Outdoor Adventure Programs

A) Spring Outdoor Adventure Program, Parker Collegiate Institute, Brooklyn Heights, New York (N=65)

Each year, during the month of May, students at Parker Collegiate may choose from a wide variety of full time, month long special experiences. Among outdoors offerings students may choose an extended camping experience, or a wilderness expedition, or may participate in an archeological expedition. The experiences are full time, largely group activities. They feature on-going informal discussion and reflections rather than formal classes or seminars. Most of the students come from upper-middle or higher income families.

B & C) Senior Semester Program, Mitchell High School, Colorado Springs Colorado (Fall, N=25; Spring, N=37)

Senior Semester is a full time, 18 week program open to students in the 12th grade. Following a three day retreat and a general orientation, each student selects four different learning blocks from among the several offered. The blocks last three to four weeks each and include experiences in outdoor adventure, living in a rural setting, firsthand study of the criminal justice system, internships in community organizations, creative projects, and several others. Each option is intensive (full time) and experiential. There are few formal seminars, but most options are group efforts including ongoing discussions with the instructors and the other participants. Most of the students are from middle and upper-middle income families.

D) Spring Outdoor Adventure (N=25) and Spring Community Study (N=35, Saint Benedict's Preparatory School, Newark, New Jersey (N=25)

All students at St. Benedict's Preparatory School participated in these five week, full time intensive investigations of a single topic or interest. Designed to be as different as possible from the traditional classroom approach, the projects rely on first hand experience, student leadership and responsibility, group interaction and personal risk-taking. All 9th graders participate in an outdoor experience--either backpacking on the Appalachian Trail, or a bicycle trip following George Washington's route through New Jersey. The 10th and 11th graders choose one of the following community study options--making a film; observation of the court system culminating with a mock trial; producing a children's play and touring it around the city; investigation of urban problems through interviews and site visits. Each are group projects with ongoing, informal discussion and reflection. Students are evaluated through written or oral tests, practical demonstrations of their skills, and a group presentation to the rest of the school during the final week. St. Benedict's is an independent college preparatory school for boys in grades 9-12. Approximately 3/4 of the students are black with 60% coming from the city of Newark.

Career Internships

A) Community Internship Program, Beverly Hills High School, Beverly Hills, California (N=33)

This program operates out of the school's Applied Education Center. Students in the 11th and 12th grades may serve as interns (for credit but no pay) in stockbrokers' offices, law offices, medical centers, TV studios, retail stores, hospitals, government agencies, social service agencies and in many other settings. The internships are applied for and performed on an individual basis and typically run two or three hours daily for one school term (about 16 weeks). There is no accompanying class or seminar, though some students do write reports on their work and/or have informal and occasional discussions with the program coordinator. As might be expected in Beverly Hills, most of the students come from highly affluent families.

B) Medical Careers Program, Central High School, Minneapolis, Minnesota (N=12)

This program is deliberately designed to develop inner city youths' interest in health professions and the background and confidence needed to pursue them as careers. The program operates for half the school day for one trimester (12 weeks) and is repeated three times each year. For half of each day the students (who are in the 11th grade) intern in a variety of medical departments in a large Veterans' Hospital. Four half-days each week are spent studying biology at a nearby community college, and the fifth in a classroom experience featuring discussions with minority health professionals. The students, who receive credit but no pay for the experience, come largely from low-income families.

C) Spring Career Internships, Parker Collegiate Institute, Brooklyn Heights, New York (N=26)

Career internships were a second option within the previously mentioned spring program at Parker Collegiate. Students served as unpaid interns in a wide variety of businesses, public agencies, and governmental offices in New York City. These were intensive, high level, full-time experiences and were done, for the most part, on an individual basis without a group seminar or formal reflective component.

D) Community Construction Program, St. Paul Public Schools, St. Paul, Minnesota (N=24)

The Construction Center was one of several programs within the Students Serving Students project which operated in St. Paul in cooperation with the school system and with funds from the Concentrated Employment

Training Act (CETA). The students came from several city high schools to a center where they learned the basic skills of construction. These skills were then applied through contracted services performed within and outside the school systems- from partitioning walls to building an entire garage. Students received school credit for the training and pay for its application in real projects. They could be in the program for a full or half day for two 11 week trimesters. All were from low income families.

E, F & G) Community Involvement Personal Educational Development (CIPEO), South Brunswick High School, Monmouth Jct., New Jersey 10th grade, (N=58,) 10th grade plus career education, (N=36;) 12th grade, (N=39)

This is a program involving all high school students in grades 9 through 12 (approximately 1,000). It was created to supplement and enrich classroom instruction, as well as provide totally new experiences through direct involvement in the community. The program is designed so that each student spends a minimum of four hours one day a week at a selected activity. The activities are grouped into six major areas: outdoor education, teacher aide, government, independent projects, occupational exploration, and social services. For the most part students do not have a formal seminar related to this involvement experience but do have some written assignments and have individual discussions with their school and field supervisors. The school population is not easily typed, though most students are from professional families with smaller numbers from working class and rural backgrounds.

Despite the variety of experiences available, the program has been grouped with career programs for this study as the largest number of placements can be considered career-related and, for one subgroup, they were accompanied by a career seminar. For some purposes all CIPED students are combined in the study, and for others they are separated into 12th graders (with 3 years of previous CIPED experience) and 10th graders, and 10th graders with accompanying career seminar.

H) Community Based Learning Programs, Allegheny Intermediate Unit, Pittsburgh, Pennsylvania (N=16)

Seniors in several suburban high schools in Pittsburgh (Upper St. Clair, Keystone Oaks and North Hills) were engaged in full-time career internships for a semester. The major purpose of the program was to enable students to explore, in depth, a vocational or career interest, which they may follow upon completion of their education.

Students pursued a wide variety of interests such as theatre, horticulture, merchandising, secretarial, journalism, physical therapy, medicine, psychology, television, hotel management, etc. Students attend weekly seminars, and keep a journal as a way to continuously analyze and assess their experience.

The participating schools were public high schools in suburban Pittsburgh serving a lower to middle class population.

Community Study

A) Consumer Action Service, St. Paul Public Schools, St. Paul, Minnesota (N=27)

This program is part of a larger project entitled Students Serving Students which is funded as part of the Concentrated Employment Training Act (CETA). The students come from several different schools to a particular center for half of each school day. There they study a variety of consumer issues, attempt to resolve their own and others' consumer problems, and, as a final project, produce a consumer guide. Several students also have internships with agencies involved with consumer issues. Instruction in basic academic skills and seminars on a variety of issues are central to the program. The students are mostly in the 10th or 11th grade and nearly all come from low-income families.

B) Community Participation Program, Kirkwood High School, Kirkwood, Missouri (N=51)

This a 9th grade elective program in which students take four academic subjects in a block: English, mathematics, citizenship and science. During the first and third quarters students take all classes in the school. In the remaining weeks students may opt to participate in the community for a two-hour period twice weekly. Students do volunteer service, are involved in consumer and ecological projects, and participate in other political activities. They also take numerous field trips to the courts, government offices, and to scientific institutions. Students also produce some product from their project, and discuss their project thoroughly with their instructors. Kirkwood is a suburb of St. Louis, Missouri, and is populated largely by upper-middle income families.

C) Consumer Action Course, Southwest Secondary School, Minneapolis, Minnesota (N=34)

This elective course open to students in grades 10-11, consisted of a two hour English/Social Studies course in which they interned two times a week in government and business to learn first-hand

how these organizations deal with consumer problems. Students also ran an "action line" in which they attempted to solve consumer problems of other students, neighbors, parents, etc. The students had weekly seminars in which they learned about consumer law, bureaucratic organization; verbal and written communication; political process, etc. Southwest is an urban school in Minneapolis, Minnesota serving primarily a middle and upper middle class population.

D) Learning Unlimited, North Central High School, Indianapolis, Indiana (N=94)

This program, open to 10-12 grade students, offers full or part-time alternative courses and experiences to approximately 300 students per year. There are several options available--most students participated in individual internships in which they pursued specialized interests in the arts, human services, government or business. A small number of students were involved in extended trips. Another group participated in the government program, which consisted of classroom study and a community project such as interns with government officials at the state and national level, working on political campaigns, or investigating social and political issues. This is a suburban public school and most students come from middle and upper-middle class income families.

E) Spring Community Study Program, St. Benedict's Preparatory School, Newark, New Jersey (N=35)

See p. 11 under Spring Outdoor Adventure, St. Benedict's, for a description of the community study program.

Comparison Groups

As indicated earlier there was at least one comparison group for each category of programs. These groups were not used as comparisons to the entire category but to a particular program within it to which they were matched by way of being from the same school population, age and grade, grade-point-average, and socio-economic status. The specific difference was that they were not engaged in an off-campus, experiential program during the prepost test period.

Students from Comparison Group 1, Hopkins, Minnesota (N=89) were enrolled in the regular 12th grade social studies course. Comparison Group 2 was made up of students from Mitchell High School, Colorado Springs, (N=39) who were enrolled in a 12th grade psychology class. Students from Comparison Group 3, St. Benedict's, Newark, New Jersey (N=49) were comparisons in that they were a random sample of students at St. Benedict's who took the post test before the Spring experiential program began rather than after it. Students from

Comparison Group 4 Packer Collegiate, Brooklyn, New York (N=58) were participants in the Spring program who chose an in-school enrichment experience (language study, painting, dance, diplomacy seminar, etc.) instead of an off-campus experience. Students from Comparison Group 5, Kirkwood, Missouri (N=18) were ninth grade students in the same class as the experimentals but who did not participate in off-campus experiences. Students from Comparison Group 6, North Central, Indianapolis Indiana (N=85) were selected from 10th-12th grade English classes in the regular school program to match those in the alternative school.

Selection of Issues

The first step of the research process was to survey the directors of the 33 experiential programs. They were asked what they believed to be the actual effects of their programs on students, what each had directly experienced, seen, and heard.

There was a striking similarity in this "testimony of concerned observers." They described a core set of outcomes which each of them had observed whether they represented programs in small towns or large cities, work with low income or affluent youth, or programs featuring oudoor adventure, service, internships, or political action. The important implication was that there are common threads that unite a variety of exemplars of experiential education.

Among the observed effects reported by the directors were 24 which appeared with high regularity. This list was redrawn as a questionnaire and in May, 1978, administered to nearly 4,000 students in 33 programs. The students were asked which, if any, of the outcomes represented what they personally had gained from their program. A summary of the results of this survey is presented in Table 1. On 14 of the 24 items there was an average agreement level of over 80% across all programs. The most frequently cited outcomes fit into three major categories--social, psychological, and intellectual growth. These became the major areas of investigation for the project itself.

The Research Questions

In regard to social development, the research questions were as follows: to what extent do experiential programs have a positive impact on students': a) level of personal and social responsibility; b) attitudes toward others; c) attitudes toward active participation in the community; and d) involvement in career planning and exploration. In regard to psychological development, both general self-esteem and self-esteem in social situations was assessed, as was moral development. Finally, in regard to intellectual and academic growth, students were asked for self reports on learning, were tested on problem-solving and, as mentioned above, tested for levels of moral reasoning.

In addition to looking at the general effects of experiential education on student participants, we also were interested in determining the ways in which different program forms (community service, internships, political action, community study, and adventure education) and formats (length, intensity, characteristics of the individual field experience) affect student learning. For example, do short-term experiences of three to four weeks show any effect on attitudinal change? Does the intensity of the program--two hours versus ten hours per week--affect student outcomes? Are some types of programs, e.g., community service, more likely to promote a sense of social responsibility or interest in community participation? To what extent do the characteristics of each student's individual experience affect the results?

TABLE 1

WHAT STUDENTS LEARN IN EXPERIENTIAL LEARNING

COMPOSITE PROFILE OF 33 EXPERIENTIAL PROGRAMS (N=4000)

ITEM (in rank order)	PERCENTAGE OF RESPONSES		
	Agree*	Disagree*	Don't Know
1. Concern for fellow human beings	93%	4%	3%
2. Ability to get things done and to work smoothly with others	93	4	3
3. Realistic attitudes toward other people such as the elderly, handicapped, or government officials	88	4	8
4. Self-motivation to learn, participate, achieve	88	7	5
5. Self-concept (sense of confidence, sense of competence, self-awareness)	88	7	5
6. Responsibility to the group or class	86	3	11
7. Risk-taking--openness to new experiences	86	7	8
8. Sense of usefulness in relation to the community	86	8	6
9. Problem-solving	86	9	5
10. Risk-taking--being assertive and independent	86	9	5
11. Accept consequences of my own actions	85	9	6
12. Gathering and analyzing information, observation, reflecting on experience	84	8	7
13. Knowledge of community organizations	82	7	11
14. Responsibility for my own life	80	10	9
15. Awareness of community problems	78	13	9

TABLE 1 (continued)

ITEM (in rank order)	PERCENTAGE OF RESPONSES		
	Agree*	Disagree*	Don't Know
16. Assume new, important tasks in community and school	78	14	8
17. Communication skills (listening, speaking, presenting ideas through variety of media)	77	11	7
18. Awareness of community resources	71	13	16
19. Realistic ideas about the world of work	71	18	11
20. Learning about a variety of careers	70	22	8
21. Use of leisure time	60	26	14
22. Narrowing career choices	54	34	12
23. To become an effective parent	52	29	19
24. To become an effective consumer	46	32	22

*Agree and strongly agree are combined; disagree and strongly disagree are combined.

The Research Method

Test Instruments

The overall effects (the dependent variables) of social, psychological and intellectual development were operationally defined as scores on the test instruments and questionnaires employed in the study. The specific instruments used to measure psychological development were the Defining Issues Test (moral reasoning), the Janis-Field Feelings of Inadequacy Scale (self-esteem in social situations), and the Rosenberg Self-Esteem Scale. Social development was measured by the Social and Personal Responsibility Scale (social responsibility), three semantic differentials (attitudes toward others and toward community participation) and the Owens' Career Exploration Scale (career maturity). Intellectual development was investigated through the Problem Solving Inventory and through self reports of participants. The test battery included both standardized tests and adaptions of standardized tests. Two of the tests, the Social and Personal Responsibility Scale and the Problem-Solving Inventory were original instruments designed specifically for this study. These instruments and the scoring guides are available from the Center for Youth Development and Research, University of Minnesota.

Because the outcomes being measured were elusive, triangulation of the data appeared to be the most reasonable approach. Each outcome was looked at from several different angles: paper and pencil tests; systematic observations of parents, teachers, and community supervisors; student journals and writing samples; case studies of individual students and programs; and a host of unobtrusive measures.

Research Design

It should be stressed that this was the first large-scale evaluation of experiential education, and was necessarily an exploratory study. It aimed at developing and clarifying hypotheses about the potential impact and effective practices of experiential programs, using the most exemplary programs available to test these hypotheses. Therefore, a true experimental study, including random assignment of students to experiential and traditional programs, was neither feasible nor desirable at this stage.

In almost all the programs, for example, student participation was the result of choice, as is almost universally the case with experiential programs. Furthermore, it was neither possible nor desirable to demand more from the program directors than was already required to collect such extensive data from their students. Such realities are the norm in schools, making it rather impractical to apply the research designs developed in the laboratory

to natural settings. The approach taken was to use the most rigid design that could be applied in each setting. In six of the schools, comparison groups were available and a pre-post comparison group design could be used. The comparison groups were made up of students not involved in an experiential program, and who were virtually identical in age, grade, sex, and socio-economic status to the students in the experiential program with which they were paired. In the other schools, the best obtainable design was to test the involved students before and after their participation in the program. While this is not an ideal research design, it was crucial to include a variety of programs so that various forms of experiential programs could be compared to each other.

Analysis

The data were analyzed in two phases. In the first, pre-post results were compared for each experimental and comparison group individually, by experimental and comparison groups combined, and by direct comparison between the six experimental-comparison pairs available for the study. In the second phase, specific features of the programs were examined to assess their influence on pre-post change scores. The specific elements investigated were: type, length, and intensity of the experience, existence of a reflective component, student demographic characteristics, and the specific characteristics of individual experiences (e.g., how interesting, how demanding of responsibility, etc.). The analytical tools employed included t-tests of significance, analysis of variance and multiple regression. The conventional standard of $P=<.05$ has been adopted as an indication of statistical significance with levels between $P=<.10$ and .05 considered as trends.

Findings: Impact on Students

The results from the formal measures employed in this study demonstrated that the experiential programs did have a positive impact on the social, psychological, and intellectual development of the student participants. This conclusion, while true in general, masks significant patterns of effect and effectiveness which are summarized below.

Social Development

In the past decade, there has been a great deal of public concern about the level of personal and social responsibility exhibited by teenagers. Charges of increased privatism, hedonism, and aimlessness among adolescents have become commonplace, along with findings that they feel a strong sense of powerlessness in relation to the larger society and no sense of having a significant role in it. Experiential educators have argued that it is precisely this lack of a significant role in the community and society that has bred apathy, cynicism, and powerlessness. They counter by suggesting that placing students in responsible roles in which their actions affect others will help them develop more responsible attitudes and behaviors.

This section summarizes the findings relevant to this hypothesis: that responsible action in an experienced-based program would have a positive impact on students' levels of personal and social responsibility, have a positive influence on their attitudes towards adults and others, lead them to feel more inclined to participate in their communities and, relatedly, help them plan for and explore potential adult careers.

The results reported below indicate that experience-based programs at least can have precisely those effects. Despite the inevitable differences between specific programs, there was a strong and consistent showing of positive impact among the experiential programs as a whole. Furthermore, these gains significantly discriminated between the paired experimental and comparison groups. The latter tended to decline or show no significant change on most of the scales and sub-scales relating to social development. These results are outlined below according to the specific scales employed.

Social and Personal Responsibility Scale (SPRS). The overall results from the total SPRS scale indicated general positive movement by the experimental groups and no change by the comparisons. When the six pairs of experimental and comparison groups are compared to one another, four of the experimental groups had significantly greater increases than their matched comparison group. The other two pairs both showed decreases on this scale. Figure 1 gives more detailed information on this comparison.

All experimental groups combined had a mean increase of almost two full points (+1.92,P=<.0001) while the combined comparisons declined (-.09, P=NS). More precisely, 23 of 27 experimental groups increased, 13 by at least 1.50 mean points and at a level of statistical significance. Of the four groups which did not increase, two had the highest pre-test scores of any of the groups and were still among the highest on the post-test; the other two were from economically and educationally disadvantaged groups who generally tended to do poorly on these paper and pencil measures. In contrast to the experimental groups, five of the six comparison groups declined, two at a level of statistical significance.

There were some differences by program types. Career Internship programs showed the largest positive gains (an average of 2.58 points); Community Study/Action was next (1.77); followed by Service (.63) and Outdoor programs (.30).

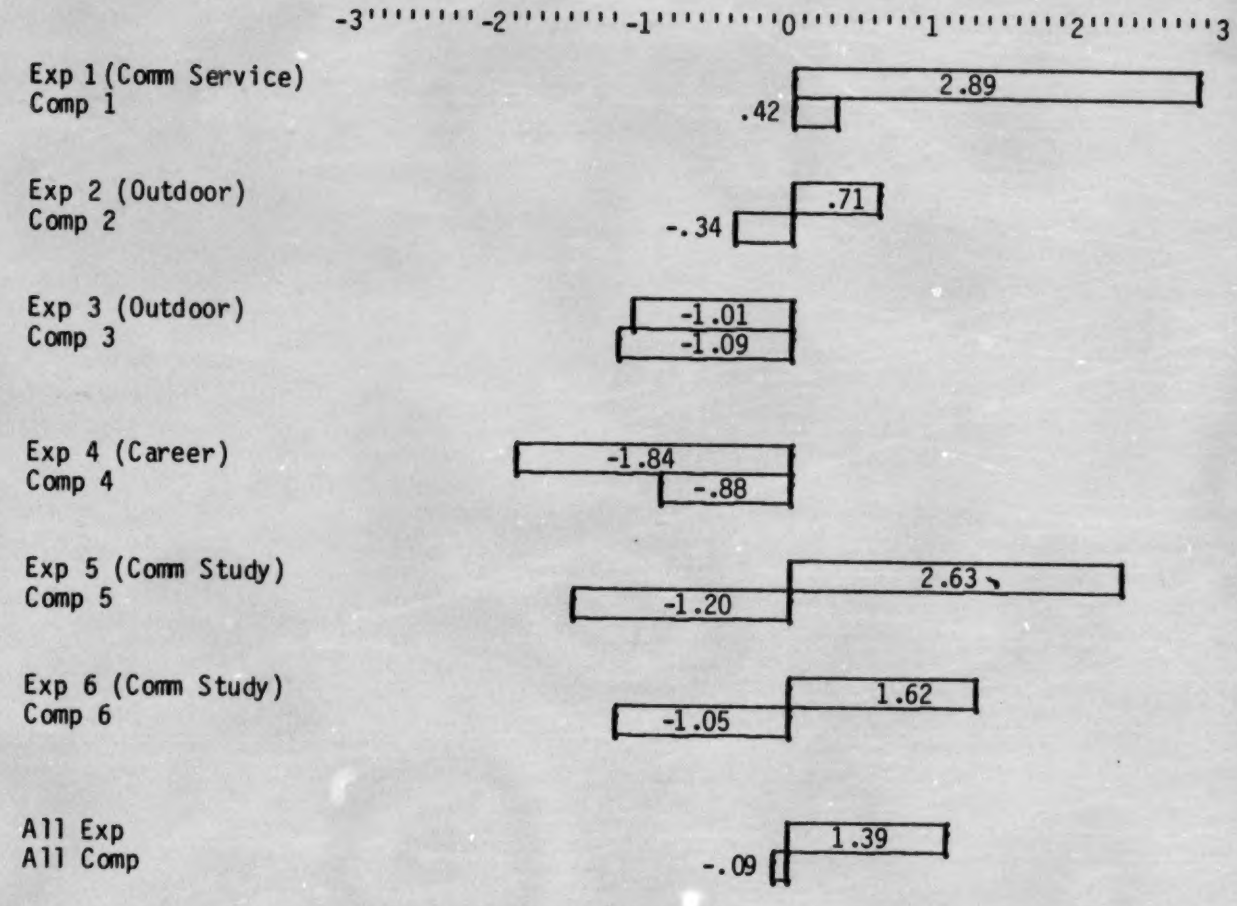
SPRS Subscales. The SPRS contained five subscales relating to sense of duty, social welfare orientation, social efficacy, sense of competence and assessment of performance. The combined total of all experimental groups showed significant positive change on all five subscales while, among the comparison groups (combined) there was no significant change on any subscale except Social Welfare--in which there was a statistically significant decrease. Nine of the experimental groups showed positive change on each subscale. There were only two instances of significant positive change among the comparison groups, both on the Competence subscale.

The precise pattern of change was more complicated. The subscales showing the most frequent positive change were those relating to competence (22 of 27 experimental groups) and Performance (19 of 27). The comparison groups also made their strongest showing on these scales though to a smaller degree. On the Efficacy and Duty subscales the patterns for the experimentals was similar to that shown on Competence and Performance but with somewhat less positive change. The Social Welfare scale, however, showed a pattern substantially different from the other subscales. The experimental groups showed their smallest (+.12 mean gain) and least consistent increase (13 of 27 groups) on this dimension. At the same time, the comparison groups showed a statistically significant decline (-.18,<.05) spread over five of six programs. Stated summarily, the experimental groups made their strongest increases on Performance, Competence, and sense of Duty while the scales which most sharply discriminated between experimental and comparison groups were Social Welfare and, to a somewhat lesser extent, Efficacy and Performance.

Overall, the strongest changes were toward taking responsible action as opposed to having more responsible attitudes; and, among attitudes, toward having more personally responsible attitudes as opposed to socially responsible attitudes. This finding is consistent with most research on attitudinal and behavioral change which suggests that changes in behavior tend to precede rather than follow changes in attitude. It also suggests that the traditional model in citizenship education, that instruction in proper

FIGURE 1

Social and Personal Responsibility Scale
Pre-Post Mean Gains for Six Experimental
and Comparison Groups



attitudes about personal and social obligations will lead to responsible behavior, may need revision. While the evidence from this study can only be suggestive of that conclusion, it is further strengthened by the fact that most of the comparison students were in social studies classes which deliberately, and apparently ineffectively, aimed at improving attitudes toward taking personal and social responsibility.

One further point from the SPRS data bears mention. Students in service programs had the highest pre-test scores on the SPRS followed by those in career internships, outdoor programs, and community study. The advantage for students in service programs was largely accounted for by their higher scores on the duty and the social welfare subscales. This would be consistent with the fact that these students had volunteered for programs in which helping and serving others is the major task (in contrast, students in outdoor programs had the lowest social welfare pre-test-and post-test scores). Students in Career internships had the highest scores on the performance and competence subscales which seems consistent with their choosing placements where they would be working independently with and as adults. It also coincides with their being the highest-ranked students on the two measures of self-esteem reported on later.

Attitudes Toward Adults. A common critique of modern socialization practices is that young people are locked in an adolescent ghetto separated from meaningful interaction with adults. The implicit assumption is that separation breeds suspicion, if not hostility, and that greater contact with adults would promote more positive attitudes. This latter hypothesis was confirmed by the results of this study. Students in the experiential programs entered into collegial relationship with adults that are atypical of most school and work settings. These students tended to show large consistent changes on the semantic differential scale toward more positive attitudes toward adults.

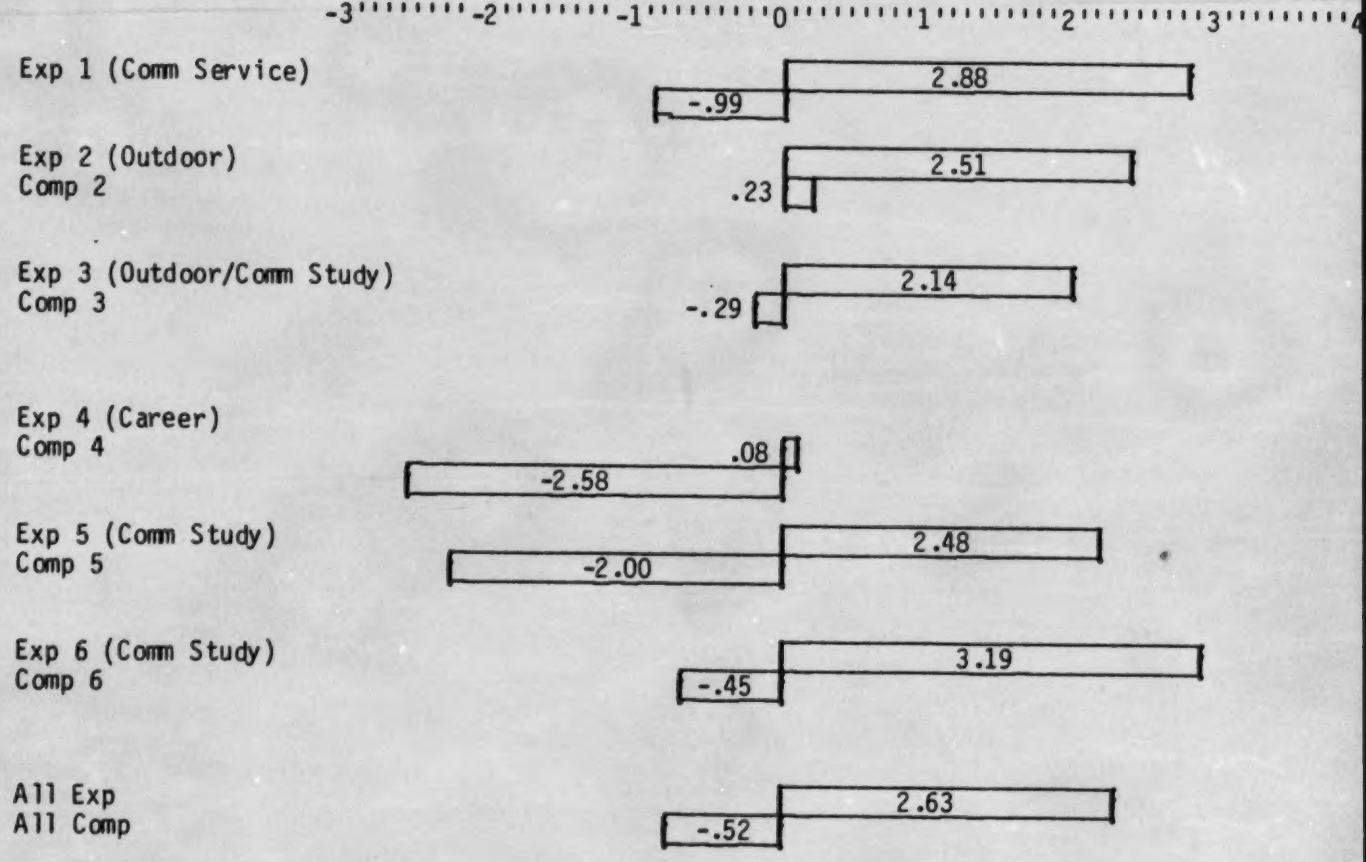
When the six pairs of experimental and comparison groups are compared to each other, all six of the experimental groups showed a significantly greater increase than did their matched comparisons. This comparison is shown in Figure 2.

There was a positive change in 22 of the 27 experimental groups, and the combined mean change for all the experimentals was +1.45 which was statistically significant at $P=<.0001$. This mean change of near 1.5 was made on a scale of only seven possible points. Students in comparison groups, conversely, showed an overall decline of -.74 mean points spread over five of the six groups.

It is clear, from the above, that the adolescents do not automatically think more highly of adults merely because they have moved a little closer to that status themselves. It depends on what they are doing during that time. Remaining in a classroom with an adult teacher appears not to be a situation which raises their esteem of adults. Associating with adults on a collegial basis outside the classroom does, however, seem to have such a positive effect.

FIGURE 2

Attitude Toward Adults
Pre-Post Mean Gain Scores for
Six Experimental and Comparison Groups



Attitudes Toward Others. It was also hypothesized that students would develop more positive feelings toward the persons or institutions with whom they were in primary contact in their community experiences. The data, from a ten-item evaluative semantic differential scale, clearly indicates that community participation has a positive effect on students' evaluations of the people and places with whom they have been interacting. In the direct contrast between the six experimental-comparison pairs, each experimental group increased significantly while each of the comparison groups showed a decline. The difference was significant for the individual and the combined comparisons (the latter at $<.001$).

In their pre-tests the participating students rated "hospitals" and "little kids" most highly, followed by "old people," "business persons," "police" and, last, "junior high kids." On the post-tests, the ratings of all these categories had increased significantly--except for hospitals, (which showed a small increase) and business persons (which showed a slight decrease). The small increase in valuation of hospitals may reasonably be explained by the fact that the high pre-test rating (the highest of any category) left little room for positive change. That business persons were not rated higher after students worked with them is more difficult to interpret. The total number of students responding to this term was small and the pre-test ratings were quite high to begin with. It may be, though, that increased contact alone may not account for changed attitude, and that the nature of the interaction must be considered. One could speculate that the students in the business internships tended more to be observers than participants, and this might account for the lack of change.

In any case, the fundamental finding of this portion of the study is that students do tend to show increased appreciation for the people with whom they associate in their off-campus experiences.

Attitudes Toward Being Active in the Community. A further hypothesis of experiential educators is that direct participation in the community will 1) lead students to value such activity more highly and 2) increase the likelihood of their accepting community responsibilities in the future. The first part of the hypothesis was tested through a semantic differential with pairs such as "smart-dumb" and "useless-useful." The second was tested by a single continuum from "something I will do" to "something I won't do." The results from both scales confirmed the hypotheses.

At the time of the pre-test, students in experiential classes valued the general notion of "being active in the community" less highly than did students in traditional classes. The highest rating was given by students in service programs followed by the comparison group and then students in community study, career internships, and outdoor programs. The pre-test finding is somewhat surprising. One might have expected the experiential programs, particularly those focusing on service-learning and community study, to attract students who had an unusually high regard for community participation. This was not the case. Perhaps student enrollment in such programs is more related to a general disposition to pursue and accept new responsibilities or novel experiences, as compared to a desire for community involvement.

By the time of the post-test, however, the situation was reversed. All of the comparison groups decreased, while 20 of 27 experimental groups increased. The strongest gains were by students in community study and outdoor programs, and the smallest gain by students in career internships.

When the six experimental-comparison group pairs are compared to each other, it was found that five of the six experimental groups increased significantly more than did their comparison groups. It should be further noted that for four of six comparison groups the value and importance of community participation was a deliberate (and seemingly unattained) emphasis of the in-school course. A more detailed picture of the analysis of the experimental-comparison group pairs is presented in Figure 3.

A further question was whether students' evaluation of being active in the community carries over to an inclination to actually take on community responsibilities in the future. The data here revealed that secondary students rather strongly assert that they will be active in their communities. However, from a position of virtual equality on the pre-test, the experimental students increased and the comparison students declined. A direct comparison between the experimental and comparison pairs showed the difference in change scores to be statistically significant.

Career Exploration. One common critique of adolescent socialization is the inability of many youth to make a smooth transition from school to work. Many teenagers appear to have very little information about the myriad of careers available, and they fall into the trap of thinking that an interest in some activity implies a lifelong pursuit of one single occupation. An often expressed goal of experiential learning programs is to increase a young person's knowledge about work and career options. To learn whether this goal was achieved, students were given the Career Exploration Scale.

The data from this scale show that 24 of 27 experimental groups registered a positive gain, 13 at a level of statistical significance. Increases were also registered by the six comparison groups, with two at a statistically significant level. The combined change scores for both experimental and comparison groups were significant, though the absolute level of increase was substantially greater for the experimental groups.

The Career Exploration Scale contains two subscales. The first measures Career Action, or the degree to which students have been actively engaged in exploring careers. The second asks about information they have gained about a career field. Analysis of these subscales revealed that the greater overall increase for experimental students was largely accounted for by greater gains on the Action Subscale. All 27 experimental groups increased on the Action Subscale, 16 significantly so.

The analysis of the six experimental-comparison group pairs reveals that the experimental groups consistently gained more on the action subscale than did the comparison groups. In a contrast, four of the comparison groups showed slightly larger gains on the Information Subscale than did the experimental groups, but overall the gain on information were about equal for the experimental and comparisons. These patterns of change are depicted in Figure 4.

Apparently facts about careers can be effectively conveyed either in or out of the classroom. But the experiential approach adds the dimensions of active involvement in potential career choices.

Some interesting differences emerged from examining individual program scores. The highest pretest mean was attained by affluent twelfth graders an independent school and the lowest means by junior high and low income high school students. It does appear that active planning and exploring of careers is related to both age and income--with older and more affluent students having the advantage.

Among types of programs, those offering career internships had the largest increases. Two programs, one in health careers for low income minority youth and another featuring semester-long, full-time internship experiences showed increases three times greater than the average mean change. However, community study, service, and outdoor programs also showed strong increases even though they had almost no organized or explicit focus on careers. It may be that when young people want to learn about careers, they actively seek such information, on their own, in their field eperiences. Also since the scale measures actual behavior, not attitudes, it shows that students in experimental programs did have opportunities to learn about and try out a variety of careers.

In summary, the data do support the hypothesis that participation in experiential programs does, or at least, can contribute to the social development of adolescents. In at least 80 percent of the experiential programs, students increased in social and personal responsibility, gained more positive attitudes toward adults and others with whom they worked, and felt more positively toward being active in the community. In general, the comparison groups in traditional classroom experiences declined on these dimensions. Students in 75 percent of experiential programs also showed increased information about careers and nearly all (96 percent) gained in active engagement in exploring careers. Students in the comparison groups showed similar increases in information about careers, but showed no gains in actively becoming involved in a desired career field. The data also show that such increases are not necessary and inevitable outcomes of any and all experiential programs. There were almost always exceptions to the general trends suggesting there were dynamics operating within the programs that require closer analysis. Such analysis will be presented following the discussion of intellectual development.

FIGURE 3

Attitude Toward Being Active in the Community
Pre-Post Mean Gain Scores for Six Experimental and Comparison Groups

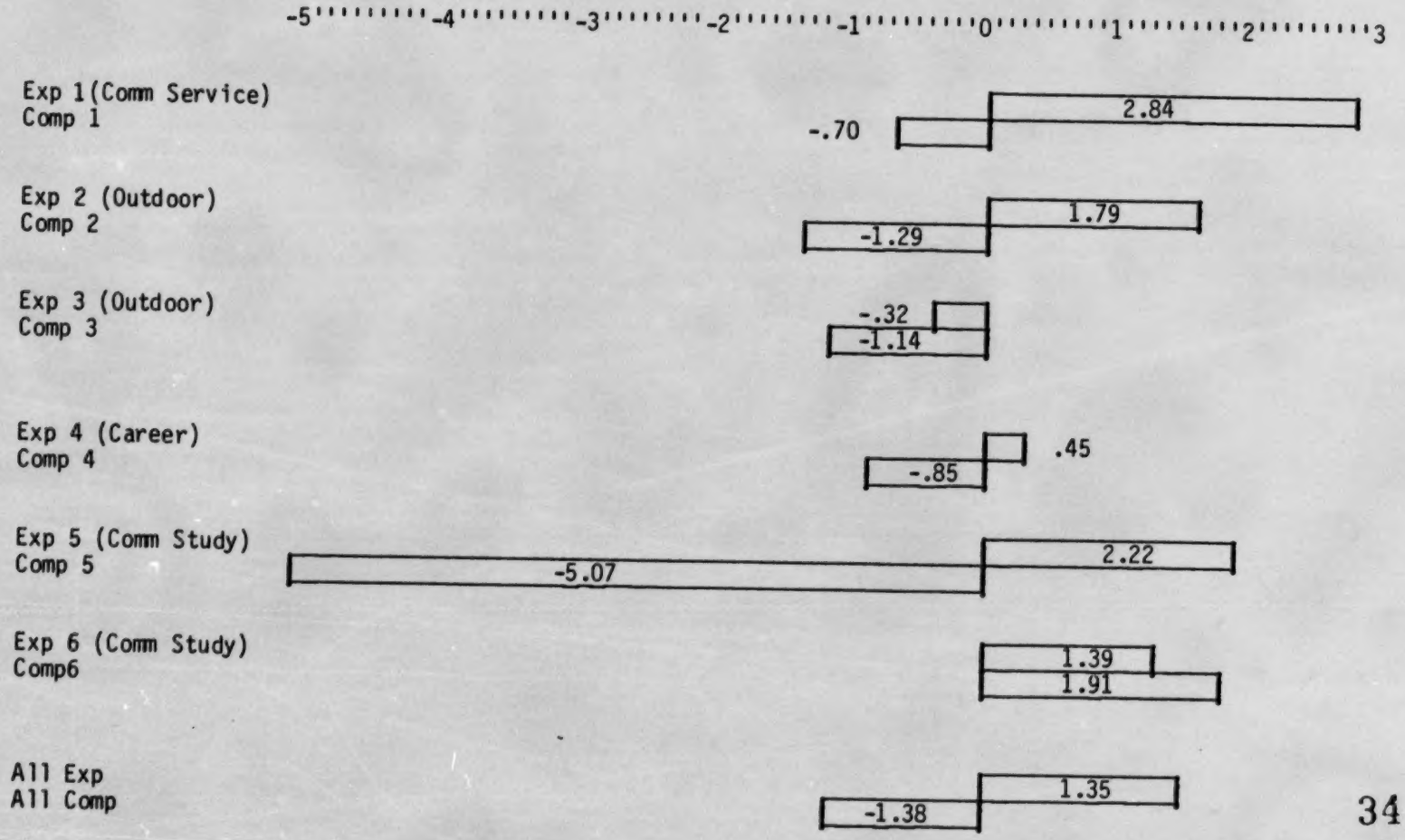
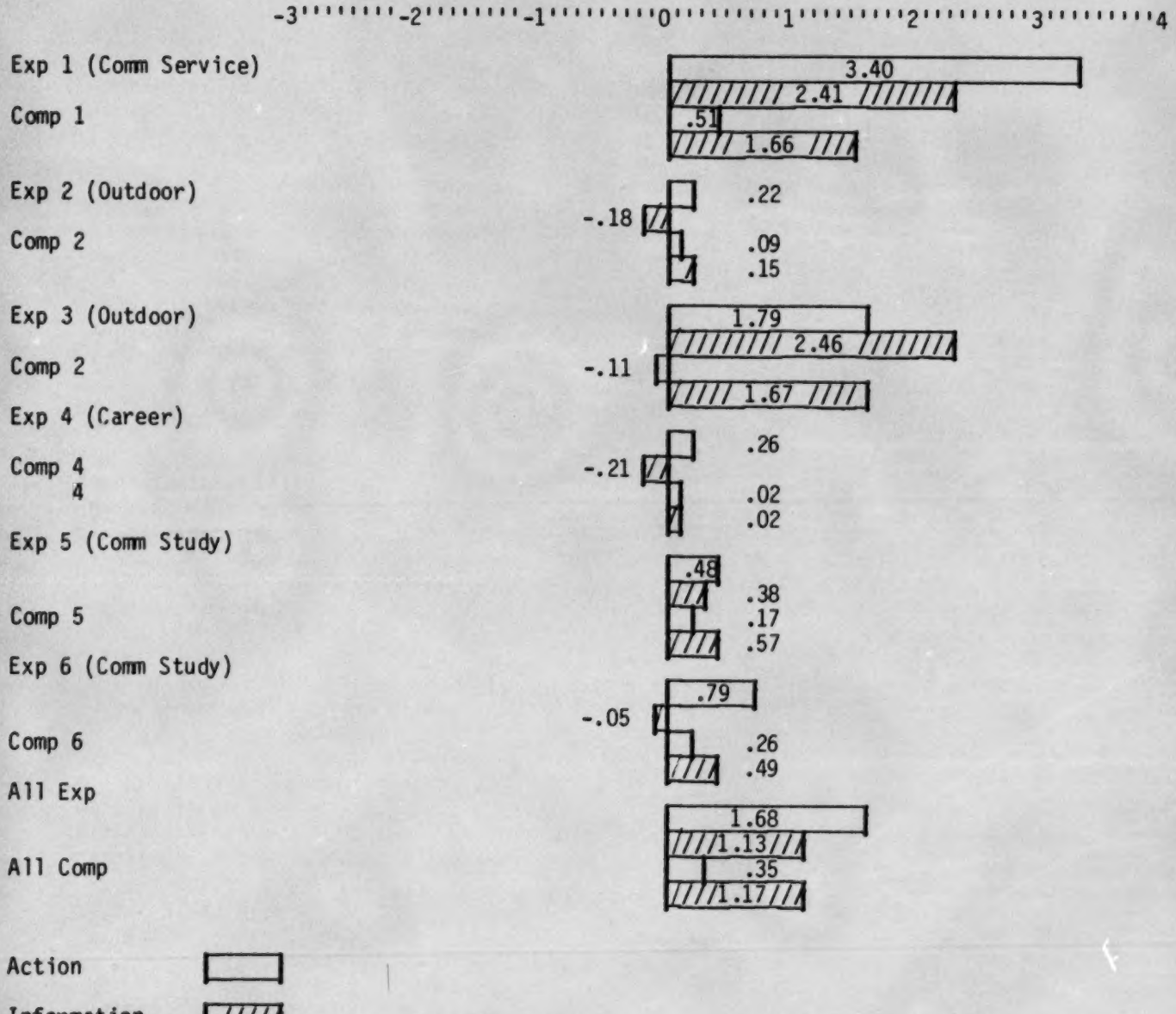


FIGURE 4

Career Action and Information Subscale
Pre-Post Mean Gain Scores for
Six Experimental and Comparison Groups



Psychological Development

An important finding in research in schools is that studying the formal, academic curriculum does not automatically lead to personal and psychological growth. In fact, there is a body of research documenting the largely negative impact of schooling on such variables as self-esteem, interest in learning, and personal autonomy (Sprinthall & Sprinthall, 1977). Proponents of experiential education have argued that psychological growth is more likely to be achieved through their approach to learning. They believe that placing students in well planned experiential confrontations with practical problems is an effective mode of promoting personal growth. In summary, psychological growth requires challenge, conflict, support and significant experience.

Did the findings of this study corroborate this theoretical argument for experiential programs? The answer again is affirmative, though not quite so dramatically so as was the case for social development.

Moral Reasoning. Students in two experienced-based programs and one comparison group (from the same school) were administered the Defining Issues Test (DIT) pre and post. This is a paper-and-pencil test designed to measure levels of moral reasoning as detailed by Lawrence Kohlberg. All three groups participated in identical lessons in moral development theory, the only difference being that the two experiential groups were simultaneously involved in service activities in the community.

The test results showed that both experimental groups attained significant gains in their moral reasoning scores while the comparison group did not. The increases were significant in themselves and in contrast to the comparison group. This finding substantiated that of several other studies which have likewise shown the combination of significant role-taking experiences and active reflection to be an effective means of promoting growth in this aspect of development.

Self Esteem. Students in experiential programs did show increases in self-esteem and to a degree slightly but consistently greater than those registered by comparable students in classroom-based programs.

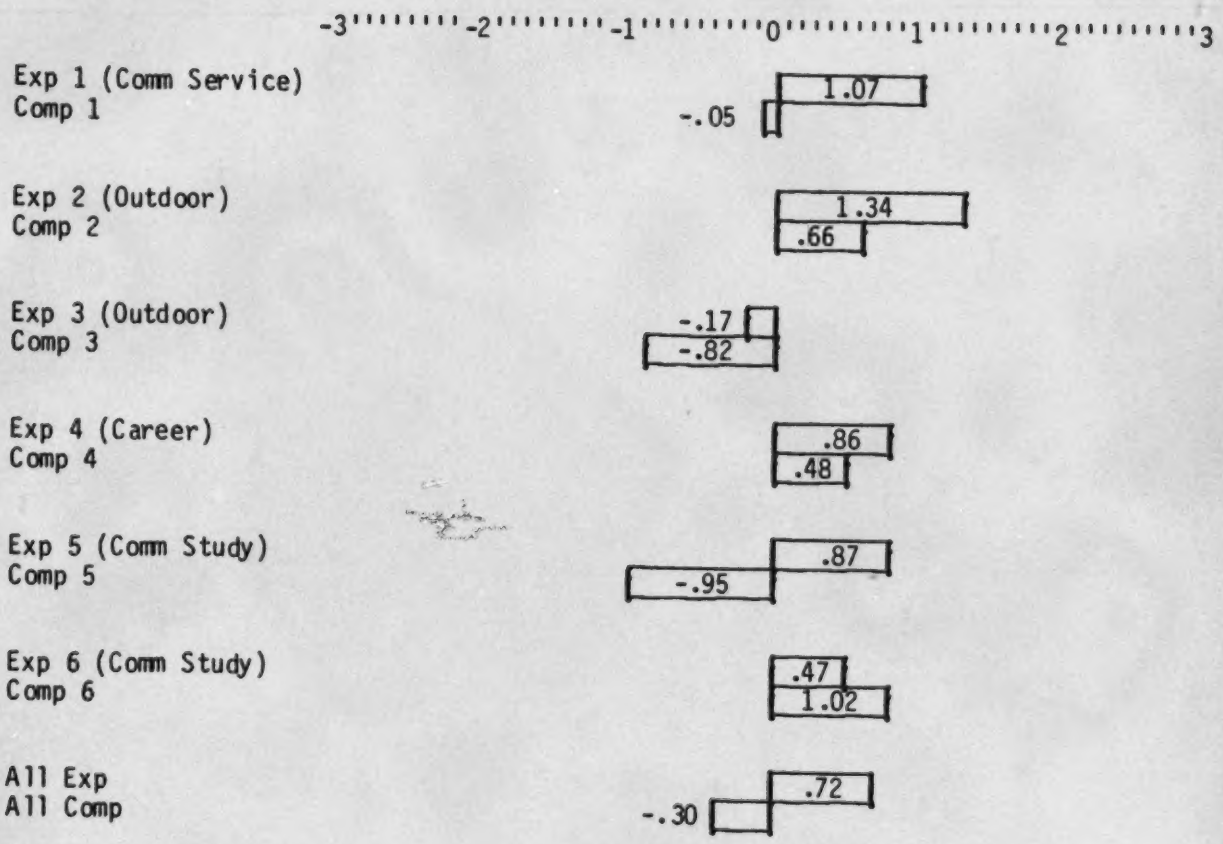
On the Janis-Field Scale, which focuses on the confidence one feels in social situations (e.g., meeting new people, speaking in front of a class), 20 of the 27 experimental groups increased, 10 at a level of statistical significance ($<.05$). On the Rosenberg Scale, which deals with more general feelings of self-worth (e.g. "I feel I have a number of good qualities"), 23 of the 27 experimental groups increased, 9 at a level of statistical significance. Students in the comparison groups also registered some gain in self-esteem, consistently on the Janis-Field Scale (5 of 6 groups increased, 3 significantly) and sporadically on the Rosenberg Scale (3 of 6 groups increased, 2 significantly). In comparing the six experimental groups against their six comparison pairs, the experimental groups had greater increases on both scales, but this advantage was statistically significant only on the Rosenberg Scale. Figure 5 showed the pattern of change for the six experimental-comparison group pairs on the Rosenberg Self-Esteem Scale.

Among program types, the highest absolute levels of self-esteem, even on the pre-test, were registered by students entering career internships. It may be that such programs attract students who are relatively more sure of themselves, at least enough to test themselves in adult career roles. The most consistent pre-post gains were registered by students in outdoor programs--both in comparison to other experiential programs and to their own gains on the social and intellectual dimensions of growth examined in the study. Since no other program category showed such consistent results, it suggests that intensive outdoor experience may have a particularly strong effect on self-esteem. This may result from the intensity and uniqueness of such experiences and/or from the fact that evidence of achievement is clearly seen by, matters to, and is immediately reinforced by both teachers and peers.

In summary, the results from the test of moral reasoning and the two measures of self-esteem lend support to the hypothesis that experiential programs can promote the psychological development of adolescents. The community service programs had a more positive effect on moral reasoning than did the comparison group in a traditional classroom situation. It is the combination of action and systematic reflection that appears to stimulate moral judgement. Overall, the experiential programs were only slightly more effective in increasing self esteem than were the comparison groups. The data do suggest, however, that the impact on self-esteem is strongest when the experience is most intensive and most dissimilar from ordinary school activities.

FIGURE 5

Rosenberg Self-Esteem Scale
Pre-Post Mean Scores for
Six Experimental and Comparison Groups



Intellectual Development

Theorists of learning and intellectual development from Aristotle through John Dewey to James Coleman have stressed the necessary relation of experience and education. Experience serves both as the source of knowledge and as a process of knowing. Education is of, by, and for experience. The study examined this relation by looking both at academic learning and intellectual development.

Amount Learned. Because the programs had widely varying academic objectives it was not practical to directly test the academic learning assumptions through any standard test of facts or concepts. Instead, students were asked how much they felt they had learned in their experiential program compared to what they learned in an average class in school. Seventy-three percent of the students reported learning more (41 percent) or much more (32 percent) in their experiential program, with 25 of 27 programs having mean responses that rounded off to 4 ("learned more") out of a possible 5 points. The mean responses of the other 2 programs were somewhat over 3 ("learned about the same"). Only 9 percent of the students reported learning less.

While all programs received high ratings on this dimension, there was a rather large spread between the higher and lower ranked programs which invited some speculation about the differences between them. Of the 12 highest ranked programs, 11 had a clearly defined seminar/reflective component, an element which characterized less than half (7) of the remaining 15 programs. A second difference was that 8 of the 12 programs with highest ratings were composed of students who might be expected to have a low opinion of regular classes. Four involved students in special alternatives for economically and educationally disadvantaged students, and four others involved students who had opted out of regular school for a full semester (one year) to participate in an experience-based program. These factors did not characterize any of the lower-ranked programs. Finally, the higher ranked programs were longer and more intensive than the lower programs.

The data indicate, therefore, that students tend to feel they learn more from experiential programs than from regular school classes and that this is most pronounced when the experiences are longer (at least 12 weeks), more intensive (at least 2 hours daily), include a formal reflective component and, to a lesser extent, involve students who may be disenchanted with traditional classroom programs.

Problem Solving. The primary measure of intellectual development used in the study was the Problem Solving Inventory. This Inventory presented students with three interpersonal problems and led them through the steps in problem solving outlined by John Dewey. The steps are: experiencing a felt problem (approximated by a stimulus story); leaping to a solution; generating more choices and alternatives; considering the consequences; choosing; and evaluating the outcome. Student responses were scored, pre and post, according to the number of alternatives listed, the degree to which they took responsibility for solving the problem, the degree to which they justified a decision according to its consequences, and the level of empathy and complexity of thought shown in the overall analysis of the problem.

On the whole, neither the experimental nor comparison students showed significant increases on the first three indices. This appeared, however, to be more a factor of test weariness than lack of program effect. Only one program showed significant increases in the alternatives and consequences indices. This program was unique in the degree to which the students faced problems similar to those in the stimulus stories and to which problem solving per se was a central focus of their seminar sessions. One other finding of interest is that in nearly half of the cases (48 percent), the students' "best choice" was not their first alternative. This suggests that asking them to generate other alternatives did help elicit their best thinking and confirms the common sense notion that one's first impulse does not always represent one's best judgement.

The heart of the Problem Solving instrument is its Empathy/Complexity Index. This Index assesses the ability and/or inclination of the respondents to empathize with the key "other" in the story, the level of need upon which s/he focuses, and the complexity of analysis applied to the problem. It is scored on a seven point scale made up of the following levels, which are briefly described below:

1. Impulsive Action--no problems perceived.

2. Impulsive-Judgments -- solutions expressed through snap judgments and arbitrary condemnation.

3. Self-Protective--concern is for self; not being caught or manipulated by others.

4. Formalistic-Superficial Concern--shows some concern for others but superficially expressed through clichés and stereotyped thinking. Concern for rules and appropriate role behavior.

5. Relational Concern--strong emphasis on love, belonging, friendship; sympathetic to needs of others; concern for opening and maintaining dialogue.

6. Responsible Concern--concern for other's esteem, self-respect and independence; awareness of value conflicts; emphasis on empowering others.

7. Principled Concern-Beyond Self and Others--focus goes beyond immediate players in situation to social, institutional causation and generalized principles of behavior; vivid concern for autonomy for all persons.

The pre-test means were quite similar for all groups, with 27 of the 33 experimental and comparison groups having means that rounded off to level 4 (conventional, stereotyped thought and concern). On the post-test there was general movement by experimental students toward level 5, a more complex pattern of thought with a focus on relational concerns. This is discussed more fully below.

The Complexity/Empathy Index did clearly discriminate between experimental and comparison groups and between types of experiential programs. In terms of mean changes, 21 of the 27 experimental groups increased, 8 increasing at least a one-third step on the seven point scale.* Five of the 6 comparison groups decreased and one showed a non-significant increase.

Most interesting was the pattern of change among types of programs. It was hypothesized that students in experiential programs would demonstrate increased empathy and complexity of thinking, and that these increases would be most pronounced in those programs where students were 1) directly confronted with interpersonal problems similar to those in the stimulus stories and/or 2) where problem solving was a deliberate focus of accompanying seminar sessions. These turned out to be critical variables in promoting change in complexity/empathy. The 27 experiential programs were placed in one of four categories:

Type A--Students experienced problems in their field placements similar to those in the stimulus stories and had instruction in problem solving in their seminar sessions. Type A programs registered an average mean increase of .59 points.

Type B--Students experienced problems similar to those in the stimulus story and had limited instruction in problem solving in the classroom seminar. Type B programs showed an average increase of .22 points.

Type C--Students had limited experience in their field placements with interpersonal problems similar to those in the stimulus stories and had limited instruction in problem solving. These programs showed an average mean gain of .17.

Type D--Students had no experience with problems similar to those presented in the Problem Solving Inventory nor did they have direct instruction in problem solving. Type D programs showed an average decrease of -.15.

These patterns of change are shown graphically in Figure 6.

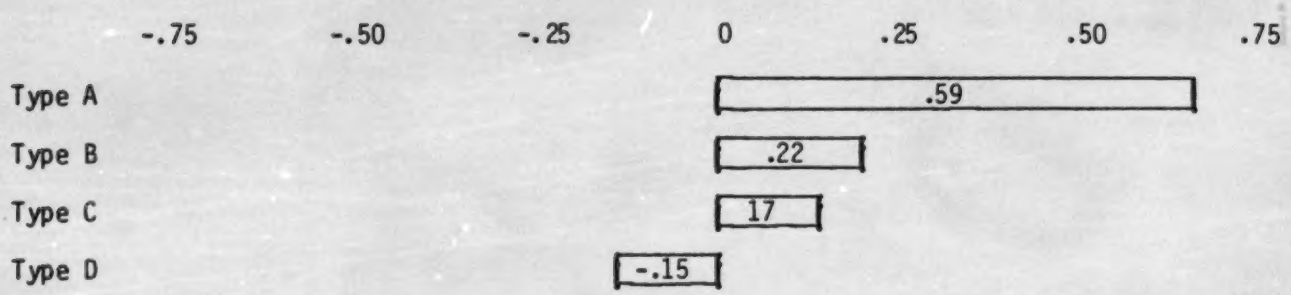
The data reported in this section suggest that experiential education programs can and do have a positive effect on student learning and intellectual development. This is most strongly the case when the program features a combination of direct experience and formal reflection on that experience. Students with this combination felt very strongly that they had "learned more" through their experiential program than they had learned in regular classes. On the problem-solving inventory, the same pattern emerged, with students in programs combining experience and reflection showing substantial increases in complexity of thinking and in ability to empathize with others.

---

*See Table 6, page 35.

FIGURE 6

Problem Solving: Empathy/Complexity Index
Pre-Post Mean Gain Score Comparisons Between Types of Programs



Summary

To recapitulate what has been said thus far, the pre-post test data show that experiential education programs can have a positive impact on students' psychological, social and intellectual development. Students in experiential programs tended to increase significantly, both in absolute terms and in relation to students in classroom programs, in the major scales employed in this study. These included tests of moral reasoning, self-esteem, social and personal responsibility, attitudes toward adults and others, career exploration, and empathy/complexity of thought.

While the results were extremely positive on a general level, they were not invariably so. That is, on every scale there were important differences among the experiential programs. The discussion shifts, thus, toward examining the dynamics within individual programs that could account for the differences in obtained results.

Findings: Correlates of Effectiveness

The second major focus of the Experiential Education Evaluation Project was to identify the program practices which were most effective in facilitating development in students. The factors examined were:

1) general program features including nature of off-campus experience, length, intensity, and reflective component;

2) student characteristics including age, grade point average, and socio-economic status;

3) characteristics of individual experiences including the degree of autonomy, amount of direction, how interesting and varied they seemed to participants, and the like.

The safest conclusion that can be drawn from the data is that no single practice or set of practices guarantees effectiveness from all students. Within every program and every type of program there were students who gained a great deal and others who did not. There were some clear patterns, however, patterns which suggest interesting hypotheses concerning the effective operation of experiential programs.

Program Features

As described earlier, there were four general types of programs in this study: community service, outdoor adventure, career internships, and community study/action. In actual practice, however, few of these were pure types. Elements of service pervaded several of the outdoor, career and community study programs. Research about public issues (the general intent of the community study programs) was often also found in service and career programs. It may have been this factor as much as anything that resulted in there being no discernible relation between program type and student growth. While service programs appeared to do somewhat better than the other program types on intellectual and social development, the advantage virtually disappeared in a regression analysis in which other program and student characteristics were controlled. Other elements, however, did appear to make a difference.

Among other program features, the presence of a formal, and at least weekly seminar proved to be the single strongest factor in explaining positive student change. This was particularly true on measures of social and intellectual development. Interestingly, there was no clear relationship between the existence of a seminar and personal growth, particularly self-esteem. Perhaps students can make personal meaning of their experiences on their own, but if this meaning is to affect their broader social attitudes and intellectual skills, systematic and directed reflection must be added.

Other factors which consistently related to positive student change were length and, to a lesser degree, intensity. Experiences lasting a full semester (18 weeks) were relatively stronger than shorter experiences, as were those in which students were in field placements two or more hours, 4-5 days per week. Of these two factors, length was stronger than intensity though even in combination they were not as powerful predictors of change as was the presence of a seminar. It must be emphasized, however, that all of these factors collectively did not predict more than about 5 percent of the variance (by regression analysis) in pre-post change scores.

Student Characteristics

The student characteristics analyzed were age; grade-point-average, and socioeconomic status. These were even less influential than program features and account for only about three percent of the variance between pre-post scores. Among the characteristics, only age showed any influence at all, with older students showing somewhat greater growth than younger students, especially on issues of social development. Neither student GPA nor socio-economic status were at all significant in predicting change. One other relevant finding was the positive relationship between student maturity (as measured by the Complexity/Empathy Scale) and the degree of satisfaction with their experienced-based program. It appears that the most intellectually and psychologically complex thinkers were the ones who rated their experiential programs most highly. In general these programs do present students with ambiguous and complicated situations, the characteristics of "real life." The more mature the student, the more likely s/he is to find such situations satisfying and comfortable.

The general finding of no strong relation between student demographic characteristics and program effectiveness does support one common contention of experiential education: that such experiences can benefit a wide variety, if not all kinds, of students.

Characteristics of Experience

One of the major problems in educational research and evaluation is that the assumption often has to be made that 1) the program has been implemented as described and 2) all students have participated in the same experience. Anyone closely associated with educational programs would probably dispute either claim. It was an aim of this study to confront this problem and go beyond gross program descriptors to examine more directly the specific experiences of students within the programs. It proved to be a fruitful search.

Compared with program features and student characteristics, the specific characteristics of an individual's experience proved to be more powerful predictors of pre-post gains. While the former two categories combined explained no more than eight percent of the variance in change scores, the latter consistently accounted for from 15 to 20 percent of variance. The finding lends credence to the notion that people experience educational programs idiosyncratically and that this is especially true in experience-based programs. The relative influence of various program features, student characteristics and characteristics of an individual's experience on overall student growth (as measured by pre-post change scores) is shown in Figure 7.

The first issue examined was the relation between characteristics of experience and general rating of the program. The characteristics contributing most strongly to a student rating his/her program as "excellent" or "good"were that the experiences was viewed as being "interesting" and that the student felt s/he was "appreciated for their work."

While feeling appreciated and doing interesting things contributed to favorable program ratings, these characteristics had little or nothing to do with whether students grew (i.e., showed an increase on the measures) from their participation in a program. The factors which contributed most strongly to pre-post gains were, rather, a mixture of features describing a combination of autonomy (e.g., "did things myself") and a collegial relationship with adults (e.g., "discussed experiences with teachers"). The 13 characteristics which made any appreciable impact on student growth are listed, by rank, in Table 2 below.

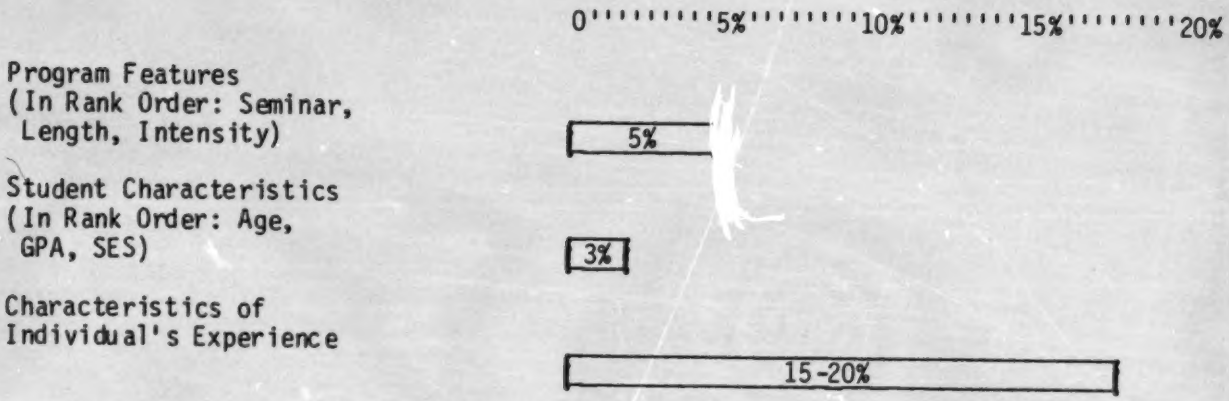
Table 2

Relative Effect of Characteristics of Experiences
on Mean Gain Scores for All Tests Combined

Rank	Characteristics of Experience
1.	Discussed experiences with teachers.
2.	Did things myself instead of observing.
3.	Adults did not criticize me or my work.
4.	Had adult responsibilities.
5.	Developed personal relations with someone on site.
6.	Had freedom to explore own interests.
7.	Discussed experiences with family and friends.
8.	Felt I made a contribution.
9.	Had a variety of tasks.
10.	Was free to develop/using own ideas.
11.	Got help when I needed it.
12.	Made important decisions.
13.	Had challenging tasks.

FIGURE 7

Factors Contributing to Student Growth



It should be noted that having an "interesting" experience did not make this list. Even more significantly, characteristics which describe a more typical student-adult relationship (e.g., "given enough training to do my tasks" and "I was given clear directions") did not contribute to pre-post gains and, in fact, correlated negatively with them on several scales.

The characteristics of experience were further examined to see if certain ones contributed more to one kind of growth than another. In Table 3 the strongest contributors to social growth are listed next to the strongest influences on indices of personal development.

Table 3

Relative Influence of Characteristics of Experience on Social and Personal Growth

Social Development	Rank	Personal Development
Discussed experiences with teachers	(1)	Did things myself instead of observing
Discussed experiences with family and friends	(2)	Free to develop and use my own ideas
Adults did not criticize me or my work	(3)	Had challenging tasks
Had adult responsibilities	(4)	Developed personal relations with someone at site
Made important decisions	(5)	Free to explore my own interests
Felt I made a contribution	(6)	Discussed experience with teachers
Had a variety of tasks	(7)	Felt I made a contribution
Free to explore my own interests	(8)	NS
Developed personal relations with someone at site	(9)	NS

As evident above, it turned out that the characteristics suggesting autonomy (e.g., "free to develop and use own ideas") were more influential in promoting personal growth (e.g., self-esteem, efficacy and competence) than in social growth (e.g., responsibility, duty attitude toward others). Conversely, the characteristics suggesting a collegial relationship with, and even guidance by, adults, showed the opposite pattern of influence. In short, personal growth was stimulated most by dealing autonomously with challenging tasks while social development accrued more from interaction with adults--as long as it was in a non-student role.

Analysis of student responses to an open-ended question asking them to explain why they rated their program as excellent or good revealed another interesting pattern. The majority of responses described personal benefits to the participant (e.g., "felt a sense of achievement or learned about a career") while only a small minority cited more socially-relevant gains (e.g., affected another person's life or increased my understanding of others' needs).

It goes only slightly beyond the data given to argue that the analysis suggests that students will rate a program highly if the experiences are interesting, if they're shown appreciation for their effort, and if they sense some personal gain from the experience. Similarly, students will make the strongest personal gain when they are given some autonomy to act on their own and to use their own ideas. In contrast, positive change in social attitudes and reasoning skills requires more interaction with adults--where the involvement is collegial, not patronizing, and when they can initiate the contact.

In summary, it was found that the most powerful predictors of growth were the characteristics of the experiences of individual students, with opportunities for autonomy leading to personal development and collegial relationships with adults and others leading to social development. Among program features, the most powerful factor was the existence of a regular seminar. Of somewhat less influence was length of program (especially if 18 weeks or longer); followed by intensity (especially 2 or more hours and 4-5 days a week). There was a small positive relationship between age and growth on social and intellectual measures. No significant relationship was found between student growth 1) general type of program, 2) student GPA or 3) student socio-economic status.

One final word may be the most significant of all. Ninety-five percent of the participants in experiential programs rated their own program as either excellent (49 percent) or good (46 percent).

Implications

Jacob Varela worked for years as an engineer before turning to the study of psychology and sociology in an attempt to find solutions to social problems. He has described the transition thusly:

> At the time I did not realize that the goal of the social sciences is not to solve social problems, but to study them. Reports of brilliant experiments generally conclude not with practical applications, but with pleas for more research....It has often been remarked that the social sciences have erred in emulating the physical sciences too slavishly. I contend they have not emulated them enough. Physical scientists know about the murky connections between 'laws' that apply to ideal conditions and their real-world applications. They know that not every solution can be tested with control groups and pristine laboratory rules: Engineers do not build two Golden Gate bridges to see which one will work best. They build the best bridge they can based on the principles they know.
>
> (Varela, 1978, p. 84)

It would be well to heed Varela's call to identify practical applications of social research.

It is not presumed that this study has definitively answered the question of whether experiential education ought to be universally adoped in secondary schools. Nonetheless, the findings of this study, combined with others reported within it, do contain implications that merit consideration and application even before "all the facts are in." Central among these are: 1) the demonstrated value of continuing and expanding experiential programs; 2) the value of a developmental focus for education; 3) the need for direct experience to meet developmental goals; and 4) the possibility and need for simultaneously working toward personal growth and social improvement.

It is important to recognize that the programs studied were carefully selected. They have been refined through three to seven years of practice, their directors have had extensive experience, and the students who enroll in them are self-selected. Therefore, they do not necessarily represent all experiential programs.

Value of Experiential Education

The clearest and most significant conclusion of this study is that well-constructed experiential programs can be a powerful educational vehicle for promoting personal and intellectual development and can do so more effectively than classroom instruction. Programs which feature a combination of action and reflection, and which offer challenge, autonomy and collegial relationships with adults are the ones mostlikely to promote student growth. One key implication of this study is that secondary schools that are committed to such developmental goals should seriously consider adopting and/or expanding experiential programs. This recommendation is a significant departure from the overwhelming trend in pulic education to a return to "the basics." The usual--and in our view--narrow meaning of "the basics" is classroom instruction in symbolic representation of experience. The consistent finding that classroom instruction in a traditional mode, as represented by the comparison groups, showed only limited improvement in personal and intellectual development in contrast to consistent strong growth for experiential programs should lead educators and the general public to rethink the notion that only classroom instruction is legitimate and effective.

Developmental Focus for Education

The conclusion that experiential programs are effective in promoting development assumes that development is a legitimate aim of education.

It is through a peculiar misuse of the English language, or perhaps a symptom of something deeper, that the comprehension of symbols and the manipulation of mediated experience has come to be identified as learning the "basics." Such an interpretation of what is fundamental ignores the source of learning (experience), the nature of the learner (especially development), and the purpose of learning (personal growth and social improvement.) Theorists such as John Dewey (1902/1964) and Lawrence Kohlberg (1972) have made cogent arguments for considering development to be the aim of education; research on the effects of schooling (Heath, 1978; McClelland, 1973) has demonstrated the predictive power of personal development (in contrast to academic achievement) for adult success; the present study and others have shown the viability of promoting such development through deliberate educational interventions. It would seem more than reasonable for educators to act on this information. The aim and effect would not be the denigration of more traditional goals, but to imbue them with new vitality and purpose. For experiential educators as well, a focus on development can provide both a framework for organizing activities and a goal--that of promoting social, psychological, and intellectual development.

The Need for Experience

Educators who are serious about development may also have to be serious about adopting experiential methods for achieving that goal. Developmental theory, from the time of Dewey to the present, has stressed that development requires interaction, transaction, conflict, cognitive dissonance, consequential choices and action on behalf of those choices. The more that children and adolescents are isolated from broad, varied, and significant experiences in the social environment, the more must schools encourage such involvement to successfully work toward facilitating development.

Furthermore, if significant experience is truly a critical element in development, it ought not be restricted to isolated doses in the later school years but be a central focus from the elementary years and on.

Finally, the provision of more meaningful participation cannot be met by the schools alone. The findings of this and other studies that experiential programs can promote development must not be overdramatized. It would be foolish to argue or believe that a change in school practice is enough to substantially counter the effects of impoverished experience and prolonged childhood and adolescence. Ways must be found to share the educational mission with the broader society and to provide opportunities for children and youth to be more seriously involved in their communities.

Personal Growth and Social Improvement

> As the material of genuine development is that of human contacts and associations, so the end, the value that is the criterion and directing guide of educational work, is social. The acquisition of skills is not an end in itself. They are things to be put to use, and that use is their contribution to a common and shared life.
>
> (Dewey, 1934/1964, p. 11)

The above statement by John Dewey may serve as a gentle reminder that both individual and social goals are essential for either to be achieved. Perhaps one of the greatest strengths of experiential education is that it provides the opportunity to work on them simultaneously. As the individual grows from direct experience in the community, so may the community benefit, and not just in the long run. The study indicated that personal growth is a more automatic outcome of experiential education than is social development. To acomplish the dual goals of personal and social improvements, a new kind of relationship between student and teacher is necessary--a collegial mentorship.

There is much left to be learned about human development, about experiential education, and about how to bring about a better society. This study and the others cited within it are not sufficient, do not tell us all we need to know. Yet they provide a beginning and some idea of how to proceed. It is only by proceeding that we will fill in the gaps in what we need to know. Again John Dewey (1932) said it best:

> The sources of educational science are any portion of ascertained knowledge that enter into the heart, head and hands of educators, and which, by entering in, render the performance of the educational function more enlightened, more humane, more truly educational than it was before. But there is no way to discover what is 'more truly educational' except by the continuation of the educational act itself. The discovery is never made, it is always making. (pp. 76-77)

Further Questions for Practice and Research

William Perry is fond of pointing out that people are bigger than the theories used to explain them. In like fashion, issues of education and human development are larger than can be contained in or investigated by one study. Therefore, it would be well to cite some important issues that require further examination.

Impact on Others and the Wider Community

If students are truly involved in significant experiences with real consequences, it should then be possible to detect the effects of their activities on others and on their communities, as well as on themselves. While the assertion is rather commonly made that experiential education programs can contribute to meeting the real economic, social and educational needs of communities and the nation (National Commission on Resources for Youth, 1974), relatively little evidence has been assembled to date. An investigation into the social and economic impact of youth participation would seem particularly important as discussion of the utility of a national Youth Service Program grows more serious (Landrum, 1979).

Who Benefits?

Important questions remain concerning who benefits most from experience-based educational programs--and why. For example, to what degree is maturity, or advanced development, a cause or a consequence of learning through experience? If the exercise of autonomy leads to growth, is the demand for it a factor of the experience or setting itself, or do certain kinds of individuals carve out autonomous roles within the experiences made available to them? Is there a relation between cognitive style and ability or propensity to learn from experience? What are the specific skills and habits

that enable a person to learn and grow from experience? Can these be isolated, and then taught and learned in the way that skills in learning from symbols have been? Such questions require a deeper, more focused examination of individuals and specific experiences than was possible or intended in this study.

How to Guide Experience and Reflection

As instructive as it may be to know that experience must be accompanied by reflection, it is not practically useful without more precise information on how best to structure, guide, and encourage such reflection. In addition, more information is needed to identify the kinds of off-campus activities which are most effective for achieving particular developmental and academic goals. One important issue, for example, is whether work-study (and other job experience) programs have effects similar to programs located in the general academic curriculum such as were the focus of this study.

Effect on Academic Knowledge and Skills

The antidote to being information-rich and experience-poor is not to reverse the condition. More insight is needed to understand how direct experience and personal development may enhance the traditional academic aims of schooling--and vice-versa.

Long-term Effects

T. S. Eliot observed: "Only in retrospection, selection,/ We say, that was the day. The critical moment/ That is always now, and here" (1963, p. 57). Similarly, the investigation of the impact of experience on development must be enriched by the study of, in Dewey's terms, "its influence upon later experiences," the degree to which "they promote having desirable future experiences" (1938/1963, p. 27). Clearly it would be important to know if patterns established in the program--of learning from experience, of participating in the community, of exercising autonomy--were continued. Also of interest would be students' assessment of what aspects of their experiences seemed particularly valuable a year or two after as opposed to during or immediately following the experience.

Research Methods

An important problem in the investigation of experiential education has been the lack of appropriate methods and instruments. The Social and Personal Responsibility Scale and the Problem Solving Inventory were developed to help fill this gap. The results indicate they were useful measures and merit futher development and refinement.

Results from this study demonstrated that paper and pencil tests can be useful in detecting important effects of experiential education. They also demonstrated some of the limitations of this approach. Evidence from this and other studies suggests that such measures are less than satisfactory for some students, particularly those with a history of negative experiences with

testing. In addition, such measures do not adequately capture the small individual changes, the critical incidents, the nuances, the sense and sensibility of experience. Thus additional techniques must be developed and used. Interviews, observations, analyses of journals, ethnographies, and case studies could be used both to triangulate and to see beneath the findings from paper and pencil measures. Such measures could uncover, in Dewey's terms, "the qualitative characteristics of things as they are orignally and 'naturally' observed" (1929/1960, p. 90).

References

Coleman, J. S. Youth: Transition to Adulthood. A report of the Panel on Youth of the President's Science Advisory Committee. Chicago: University of Chicago, 1974.

Dewey, J. The child and the curriculum. In R. D. Archambault (Ed.), John Dewey on Education: Selected Writings. Chicago: The University of Chicago Press, 1964. (Originally published, 1902.)

Dewey, J. The Quest for Certainty. New York: Capricorn Books, 1960. (Originally published, 1929.)

Dewey, J. The Sources of a Science of Education. New York: Horace Liverwright, 1932.

Dewey, J. The need for a philosophy of education. In R. D. Archambault (Ed.), John Dewey on education: Selected writings. Chicago: University of Chicago Press, 1964. (Originally published, 1934.)

Dewey, J. Experience and Education. New York: Collier Books, 1963. (Originally published, 1938, by Kappa Delta Pi.)

Eliot, T. S. Murder in the Cathedral. New York: Harcourt, Brace and World, Inc., 1963.

Heath, D. Teaching for adult effectiveness. The Journal of Experiential Education. 1978, 1 (1), 6-11.

Kerr, C. Giving Youth a Better Chance: Options for Education, Work and Service. San Francisco: Jossey-Bass, 1979.

Kohlberg, L. and Mayer R. Development as the aim of education. Harvard Educational Review, 1972, 42 (4), 449-496.

Landrum, R., et. al. Youth and the Needs of the Nation: Report of the Committee for the Study of National Service. Washington, D.C.: The Potomac Institute, 1979.

Pritchett, V. S. Moralist of exile. New York Review of Books, February 29, 1979, 3-5.

Sprinthall, R. C. and Sprinthall, N. A. Educational Psychology: A Developmental Approach (2nd Ed.). Reading, Massachusetts: Addison-Wesley, 1977.

Varela, J. A. Solving human problems with human science. Human Nature. October, 1978, 84-90